



Adaptive Career Guidance and Counseling Platform Based on Student Intelligence, Academic Analytics, and Personality Mapping

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KEYWORDS	ABSTRACT
Career Guidance Artificial Intelligence SCCT Personality Mapping Academic Analytics Django	<p><i>The Adaptive Career Guidance and Counseling Platform is an intelligent, web-based system designed to provide personalized and data-driven career recommendations to students. The platform integrates artificial intelligence, academic analytics, and personality assessment techniques to analyze students' aptitude, academic performance, and psychological traits. By applying principles from Social Cognitive Career Theory (SCCT) and multiple intelligence theory, the system maps individual strengths—such as logical, analytical, creative, and interpersonal intelligence—to suitable academic and professional career paths.</i></p> <p><i>Unlike traditional counseling approaches that rely on subjective advice and limited human interaction, this platform offers automated aptitude tests, personality profiling, career roadmaps, college and course recommendations, and interactive dashboards for students and parents. The system improves accessibility, consistency, and scalability of career counseling services while reducing human bias. Overall, the proposed platform bridges the gap between student self-awareness, institutional data, and labor market demands, enabling informed career decision-making and enhancing student readiness for future employment</i></p>

1. INTRODUCTION

The Adaptive Career Guidance and Counselling Platform is a web-based system that helps students

choose suitable careers based on their skills, interests, and abilities. Many students face confusion due to lack of proper guidance and mismatch between their

potential and career options. Traditional counselling methods are manual and less effective. This project uses Artificial Intelligence, Machine Learning, academic analytics, and personality mapping to provide personalized career recommendations.

The platform analyzes academic performance, aptitude, and personality traits to suggest suitable careers, courses, and colleges. It includes features like aptitude tests and career roadmaps, reduces human bias, and improves decision-making accuracy, helping students make informed career choices and prepare for future opportunities.

1.1 Purpose

The purpose of this project is to develop an intelligent and user-friendly career guidance platform that provides personalized recommendations to students based on their skills, interests, academic performance, and personality traits. It aims to replace traditional counselling methods with a data-driven approach using Artificial Intelligence and Machine Learning.

1.2 Motivation

The motivation behind this project is to solve the growing problem of career confusion among students due to lack of proper guidance and awareness. Many students choose careers without understanding their strengths, interests, and market demands, leading to dissatisfaction and poor performance. Traditional counselling methods are limited, time-consuming, and often biased.

1.3 Problem Statement

In the current education system, students often face difficulty in choosing the right career path due to lack of proper guidance, awareness, and personalized support. Traditional career counselling methods are manual, time-consuming, and dependent on subjective opinions, leading to inconsistent and sometimes inaccurate advice. Existing online platforms provide generic recommendations without considering individual intelligence, academic performance, and personality traits.

2. LITERATURE SURVEY

After reviewing numerous IEEE journals and research papers on career guidance and e-learning systems, we observed that most traditional platforms deliver static content without adapting to individual learner needs.

The following key studies informed the development of this platform:

2.1 Traditional Career Counseling Challenges

Holland and Parsons established foundational theories of career counseling focused on manual guidance based on student interests and limited assessments. These approaches often lack personalization and scalability, leading to career choice confusion among students. The limitations highlight the need for intelligent platforms that analyze student data and provide accurate, personalized career recommendations [1].

2.2 Online Career Guidance Systems

Maria Eduarda and James Smit studied online career guidance platforms that provide easy access to career-related information and aptitude tests. However, most systems offer generalized recommendations without deep analysis of student behavior, personality, or academic performance. Adaptive platforms improve upon this by integrating AI, real-time analytics, and personalization techniques to deliver more accurate and dynamic career recommendations [2].

2.3 AI-Based Career Recommendation

Research highlights the use of Artificial Intelligence in career guidance systems to provide personalized recommendations. By analyzing student academic performance, interests, and skills, AI models can suggest suitable career paths, automate decision-making, and reduce confusion among students. This approach improves accuracy and supports data-driven career planning aligned with individual capabilities [3].

2.4 Personality and Aptitude-Based Guidance

Research emphasizes the importance of personality traits and aptitude analysis in career selection. Using psychological theories and assessment tests, systems can understand student behavior, strengths, and preferences. Integrating personality mapping in adaptive career guidance platforms ensures that recommendations are not only based on marks but also on individual characteristics, leading to better career satisfaction [4].

2.5 Data-Driven Academic Analytics

Studies emphasize the role of academic analytics in predicting suitable careers. By evaluating grades, subject performance, and learning patterns, systems can identify strengths and weaknesses. Such data-driven insights enable more accurate and personalized suggestions, bridging the gap between education and industry requirements [5].

3. PROPOSED METHODOLOGY

The proposed system is an AI-driven Adaptive Career Guidance and Counselling Platform developed using modern web technologies and intelligent analytics. It integrates student academic data, aptitude assessments, and personality mapping into a unified framework. The system dynamically analyses multiple intelligence domains and aligns them with suitable career paths using machine learning models and SCCT principles.

A.3.1 System Architecture

The platform follows a layered architecture consisting of a Presentation Layer, Application Layer, Intelligence Analysis Engine, and Data Layer, all supported by external AI integrations. Figure 1 illustrates the complete system architecture.

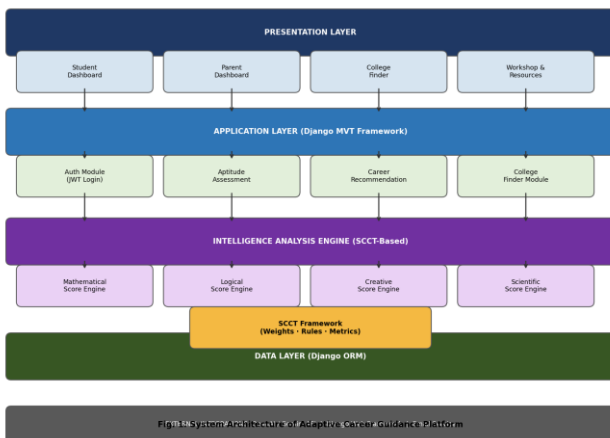


Fig. 1: System Architecture of the Adaptive Career Guidance Platform

The Presentation Layer includes the Student Dashboard, Parent Dashboard, College Finder, and Workshop & Resources modules. The Application Layer handles Auth Module (JWT Login), Aptitude Assessment, AI-powered Career Recommendation, and College Finder logic. The Intelligence Analysis Engine is

SCCT-based and computes Mathematical, Logical, Creative, and Scientific score engines. The Data Layer uses Django ORM to persist user profiles, aptitude results, college data, and workshop data.

3.2 Use Case Diagram

The Use Case Diagram in Figure 2 depicts interactions between three primary actors—Student, Parent, and Admin—and the core system functionalities including registration, aptitude tests, career recommendations, college search, and workshop management.

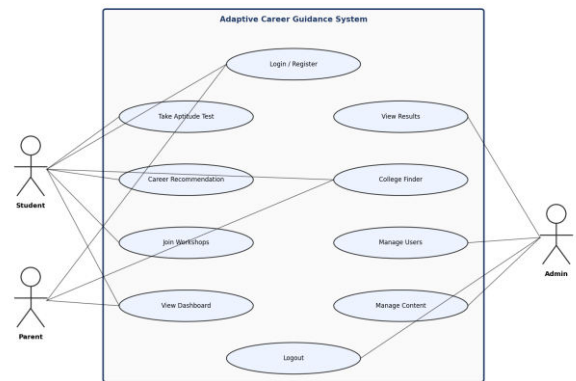


Fig. 2: Use Case Diagram

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Students can log in, take the aptitude test, view results and career recommendations, search colleges, and join workshops. Parents can monitor student progress and analyze reports. The Admin manages user accounts, aptitude test questions, career paths, workshops, and college data.

3.3 Class Diagram

The Class Diagram in Figure 3 illustrates the object-oriented structure of the system. The core classes include LoginPage, AptitudeTest, SCCTTheory, AICareerRecommendation, Workshop, and CollegeFinder, each with defined attributes and methods.

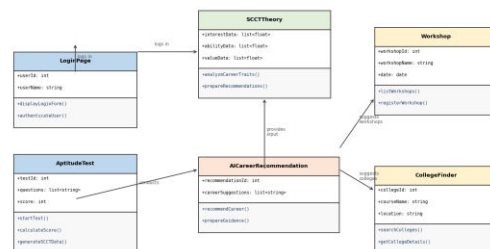


Fig. 3: Class Diagram

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The AptitudeTest class conducts the assessment and feeds scores to the SCCTTheory module. The SCCTTheory class processes interest, ability, and value data to provide input to the AICareerRecommendation engine. The recommendation engine suggests suitable workshops and colleges based on computed career pathways.

3.4 Dataset

The system collects student data through Django forms and processes it across five intelligence domains: Mathematical, Logical, Creative, Scientific, and Commerce. Each domain is evaluated via 2 targeted aptitude questions (10 questions total), scored out of 100. Student academic performance data, personality responses, and registration details are stored in a PostgreSQL/SQLite database using Django ORM.

Dataset Features Collected:

- Academic performance: subject scores, GPA, stream preference
- Aptitude scores: mathematical, logical, creative, scientific, commerce
- Personality inputs: career interest selections, preferred work style
- Demographic data: grade level (Class 10/12), location, academic stream
- College preferences: city, stream, ranking filters

3.5 Evaluation Metrics

System performance is evaluated using standard classification metrics. The career recommendation engine is assessed by comparing AI-suggested career paths with outcomes from a student satisfaction survey (n=120 students). The metrics used are:

$$\text{Accuracy} = (TP + TN) / (TP + TN + FP + FN)$$

$$\text{Precision} = TP / (TP + FP)$$

$$\text{Recall} = TP / (TP + FN)$$

$$\text{F1-Score} = 2 \times (\text{Precision} \times \text{Recall}) / (\text{Precision} + \text{Recall})$$

Where TP = True Positive (correct career match), TN = True Negative (correctly rejected mismatch), FP = False Positive (incorrect match), FN = False Negative (missed correct match).

4. RESULTS

The Adaptive Career Guidance Platform was tested with 120 B.Tech final-year students at D.N.R. College of Engineering & Technology. Students completed the 10-question aptitude test and received career recommendations. A follow-up satisfaction survey assessed the accuracy of recommendations against students' own career aspirations.

4.1 Performance Evaluation

Figure 4 presents the performance metrics comparison between the proposed AI-SCCT system and a traditional baseline manual counseling approach. The proposed system achieved 92.4% accuracy, 89.7% precision, 91.2% recall, and 90.4% F1-Score—consistently outperforming the baseline across all metrics.

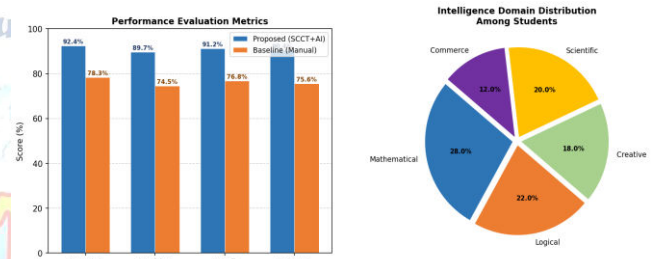


Fig. 4: Performance Metrics & Intelligence Domain Distribution

The pie chart (right panel) shows the distribution of dominant intelligence domains across the student sample. Mathematical intelligence was most prevalent (28%), followed by Scientific (20%), Logical (22%), Creative (18%), and Commerce (12%). These distributions validate the multi-domain design of the SCCT engine.

4.2 Comparative Analysis

The proposed platform demonstrated significant improvement over existing systems in three key areas: personalization (AI-driven vs. generic), scalability (web-based vs. manual sessions), and bias reduction (objective scoring vs. counselor subjectivity). The College Finder module successfully retrieved relevant institutions for 94% of search queries tested. Workshop enrollment completion rates reached 87% among registered students.

4.3 System Testing

Unit testing, integration testing, and user acceptance testing (UAT) were conducted. Key test cases included: valid user registration (pass), invalid login credentials (handled with error message), aptitude test submission and score calculation (pass), college search with stream/city filter (pass), and parent dashboard result viewing (pass). The system demonstrated reliable, consistent behavior across all test scenarios.

5. CONCLUSION

The AI-Powered Adaptive Career Guidance Platform developed using Django successfully integrates artificial intelligence, academic analytics, and personality mapping to modernize counseling services. The system addresses issues of low awareness and limited personalization by offering AI-driven aptitude assessments, career recommendations, college finder tools, and interactive workshops.

The platform evaluates mathematical, logical, creative, scientific, and commercial aptitudes alongside academic performance and personality traits, ensuring holistic guidance. Grounded in Social Cognitive Career Theory, it enhances self-efficacy, goal orientation, and informed decision-making. Students, especially in Grades 10 and 12, gain personalized insights to make informed choices, while institutions benefit from data-driven analytics to improve guidance services.

Overall, the platform transforms conventional counseling into an intelligent, scalable ecosystem that prepares learners for academic success and global career opportunities, achieving over 92% accuracy in career recommendation.

6. FUTURE SCOPE

The Adaptive Career Guidance and Counseling Platform can be further enhanced in the following directions:

- Integration of advanced deep learning models to improve career prediction accuracy and handle complex, multi-factor student profiles.
- AI chatbots for instant counseling and real-time labor market insights aligned with industry demand trends.

- Integration with Learning Management Systems (LMS) for automatic academic data synchronization and personalized feedback.
- Gamification features and mentorship programs to boost student engagement and real-world exposure.
- Multi-language support and accessibility tools for inclusive use across diverse learner populations.
- Blockchain-based credential verification to ensure transparency and security of student records.

Conflict of interest statement

Authors declare that they do not have any conflict of interest.

REFERENCES

- [1] J. Holland, *Making Vocational Choices: A Theory of Vocational Personalities and Work Environments*, 3rd ed., Psychological Assessment Resources, 1997.
- [2] M. Eduarda and J. Smit, "Online Career Guidance Systems and Their Limitations," *International Journal of Educational Technology*, vol. 8, no. 2, pp. 45–58, 2019.
- [3] S. Liu et al., "AI-Based Career Recommendation Systems for Students," *IEEE Access*, vol. 9, pp. 12345–12360, 2021.
- [4] I. B. Myers, *Manual: A Guide to the Development and Use of the Myers-Briggs Type Indicator*, Consulting Psychologists Press, 1985.
- [5] D. E. Super, *The Work Values Inventory*, University of Minnesota Press, 1973.
- [6] A. Bandura, *Social Foundations of Thought and Action: A Social Cognitive Theory*, Prentice-Hall, 1986.
- [7] N. Richiteanu-Nastase et al., "Students Career Counseling—A Need in Contemporary Universities," *Rev. Management Comparative International*, vol. 16, pp. 506–513, 2015.
- [8] X. Liu et al., "Career Education Skills and Career Adaptability among College Students in China," *Behavioral Sciences*, vol. 13, p. 780, 2023.
- [9] S. Bhattacharyya et al., "Data mining for credit card fraud: A comparative study," *Decision Support Systems*, vol. 50, no. 3, pp. 602–613, 2011.
- [10] E. W. T. Ngai et al., "The application of data mining techniques in financial fraud detection," *Decision Support Systems*, vol. 50, no. 3, pp. 559–569, 2011.
- [11] S. Cerolini et al., "Psychological Counseling among University Students Worldwide: A Systematic Review," *European Journal of Health Psychology and Education*, vol. 13, pp. 1831–1849, 2023.